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UNITED STATES GOVERNMENT

# Memorandum

TO : Chief, T/TR  
THRU : Acting Chief, D/T  
FROM : Chief, T/CST

DATE: 31 August 1965

SUBJECT: Bomb Damage Estimate on Bridges in North Vietnam

The bombing of railroad bridges on the line running South from Hanoi and the line from Hanoi Northwest to Lao Kay has caused traffic to cease on both lines. As long as the bombings continue there is little likelihood of repairs and restoration of traffic on these lines.

On the Hanoi-Lao Kay line there are 76 major bridges, at the present time 5 have suffered serious damage which will require extensive repairs or in most cases complete replacement. If steel for repairs and/or replacement were ordered from Communist China or the USSR immediately and work started on all five bridges immediately the line could not be expected to be serviceable in less than 4-5 months. This time estimate is based on the North Vietnamese ability to obtain the necessary technical and skilled labor from outside sources. To carry on the work simultaneously on the five bridges would require at the peak of operations a total of 1,500-2,000 men of which 150-200 would have to be technicians and engineers. The technicians would consist of welders, machine operators, iron workers, truck drivers, blacksmiths, riveters, etc. Practically all of the technicians except truck drivers would have to come from outside North Vietnam. There are very few trained and experienced native technicians of the type needed. The same situation pertains in the case of engineers, superintendents and foremen. It is estimated that at the present time there is enough skilled personnel already in North Vietnam from Communist China and the USSR which could be drawn from other projects to restore the bridges on this line. Should this decision be made, it would mean that other repair work, probably that on highway bridges would have to cease. It is considered more likely that additional technicians would be brought in from outside the country.

The greatest hindrance to the repair and/or replacement of the railroad bridges is the shortage of steel structurals. It is necessary to order bridge steel such as beams, angles, channels, and steel sheets from Communist China and the USSR. Fabrication and delivery would require at least 4-6 weeks at the best. Erection and repairs, once the steel is on-site, would require on the average 2-3 months.

On the railroad line from Hanoi south toward Vinh there are 27 major bridges of which 9 have been destroyed or seriously damaged. It is estimated that about 4,000 men would be required to simultaneously repair these bridges for rail traffic. Of this number 400 engineers and technicians would

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be required. If men were available immediately and materials are ordered right away it is estimated that the line could be put in operation in 5 to 6 months. However, in view of the logistical requirements southward, the economic importance of the Lao Kay line to China, the very large construction task on the Vinh line, and the acute shortage of men, materials and construction equipment it is felt that an attempt will be made to put the Lao Kay line in operation but no attempt will be made to repair the bridges on the Vinh line except perhaps for limited truck traffic.

The financial cost of replacing all of the damaged or destroyed highway bridges would strain the North Vietnamese economy. However, the more significant consideration is the requirements for manpower, particularly the need for technical and skilled labor. It is estimated that it would require more than 12,000 men to replace all the damaged bridges simultaneously. Likewise, it is estimated that it would require an equal number to temporarily repair the bridges, or build temporary structures to replace destroyed bridges. Of the 12,000 men it is estimated that 1,200 technicians and engineers would be needed.

As in the case of railroad bridges, shortage of steel will hinder the rapid replacement of highway bridges and it will be necessary to resort to timber structures, except in a few cases where wooden structures are not feasible. Cement for concrete is available and reinforcing steel can be made available locally or by importing from the USSR and Communist China. However, concrete bridge construction is more time consuming and is likely to be used only in those cases where permanent, as opposed to temporary, structures are built.

#### Summary and Conclusions

1. The Vietnamese cannot repair the bomb damage without considerable assistance. They lack skilled manpower, construction equipment, and structural steel.
2. Even if the limited Soviet and Communist Chinese technical and supervisory assistance now in North Vietnam is vastly increased choices of what lines and what bridges on what highways will have to be made. It would be next to impossible to repair all the bomb damage simultaneously.
3. Since a choice of what transportation construction will be done has to be made it is likely that the North Vietnamese and the Communist Chinese will opt for repair of the five railroad bridges on the Lao Kay line. This can be done in about four months from the time the steel order is placed.
4. The repair or replacement of highway bridges is most likely to take the form of temporary repairs to damaged bridges and temporary wooden structures for destroyed bridges. The bridges which have been destroyed over very large streams will probably be replaced by ferries because they are difficult and time-consuming to replace or repair. The decision on repair or replacement will be based on considerations of by-passes, feasibility of fords, importance of the route to the economy, and logistical considerations.

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5. It is estimated that it would take from 10 to 20 times the present work force in transportation construction, repair, and maintenance to repair the bomb damage to the transportation system if all the work was begun simultaneously. *was to begin*

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